Intention Mining: Discovering Intentional Processes from Ocean's Big Data

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Abstract

Comparable to data mining in terms of general purpose - automatically mining significant amounts of data, process mining has recently evolved and established itself as a stand-alone discipline. A process is considered a sequence of activities ordered by time. Therefore, process mining is used for discovering process models as temporal patterns in the data.

Intention mining comes as an enrichment of process mining with the dimension of intentionality. Through intention mining, we have the ambitious goal of mining intentional process models – based on the concepts of intention and strategy to achieve these plans, which would represent more suitable results for further human analysis and use. Until now, we have focused on mining intentional process models from event logs in order to provide recommendations to the agents interacting with flexible software systems. Applying design science, we created the IntentMiner which discovered the intentional models in an unsupervised manner. The artifact was evaluated in a case study with a Netherlands software company, revealing an average precision of 0.69 and an average recall of 0.97. Moreover, we explored another direction too within a different case study, based on Hidden Markov Models.

While these techniques yielded satisfactory results in the cases we used them, we would want to apply our approaches to other domains too as Oceanographic data. Considering that intentions are closely related to contextual data, a completely new setup could bring new insights into both our methods and the studied area. Finally, as future work, we also want to research an intention mining technique based on ontologies with data collected from a real-life environment.

Keywords: intention mining, process mining, intentional process models

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